

Spectrometer Magnet

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1 Introduction

The primary roles of the existing and new diagnostic line are to safely dump the unused part of the linac beam and to measure beam momentum and emittance. The new Diagnostics line starts at the end of the Lambertson magnet and is straight ahead continuation of Linac exit line. The beam is then transported using two quadrupoles to the spectrometer magnet. During normal operation and Momentum measurement the spectrometer magnet bends the beam 40° and the beam is dumped into the Momentum Dump (Dump 2). During emittance measurements (emittance measurements are usually made only during linac studies), the spectrometer magnet is off and the beam is dumped into the straight ahead dump, Dump 1. The two Loma Linda type quadrupoles (Q2 and Q3) are positioned as closely to the Lambertson magnet as was possible, fig. 1. Due to the increased magnetic stripping of H^- with energy increase the spectrometer magnet has a magnetic field of 7.5 kG and magnetic length of 2.96 cm so that the H^- beam is bent for 40° with electron stripping $\sim 0.1\%$ (for details see LU-178). The magnet is H type with 2 X 7 X 20 turns, water cooled, see fig. 2 and 3. To have 7.5 kGauss, power supply has to be set at 29.8 Volts and 90.8 Amps, see fig. 4. The power supply is HP6469C, (0-36V, 0-300A) and it is located at the end of the Linac Gallery in the Door Interlocked rack. Before any work it is done on the Spectrometer magnet or power supply this system has to be lock and tagged using LG1-SS-04 power switch. The magnetic field is read using NMR probe and NMR Teslameter. The signal from Teslameter will be

used to control power supply and keep Spectrometer magnetic field constant to the ± 1 Gauss.

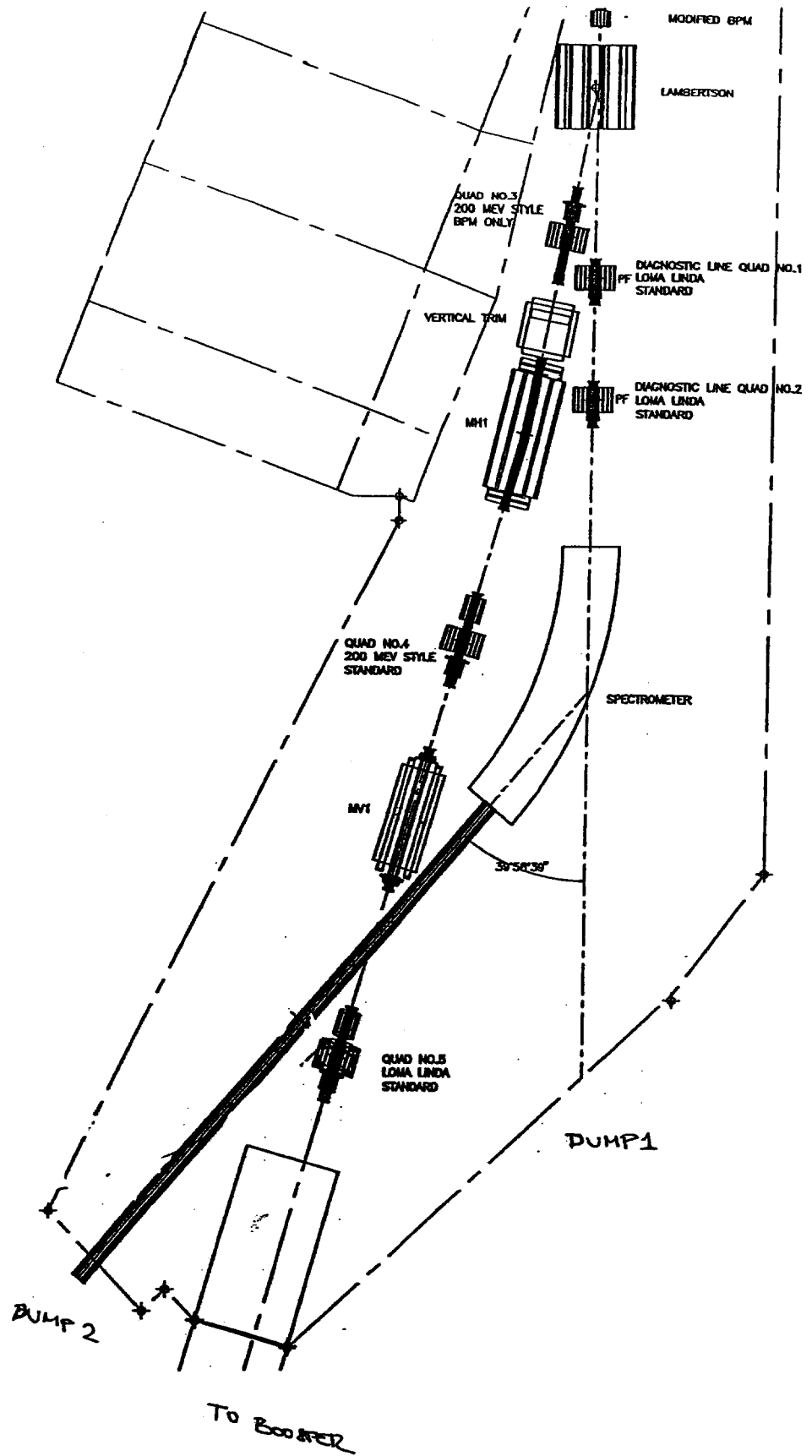
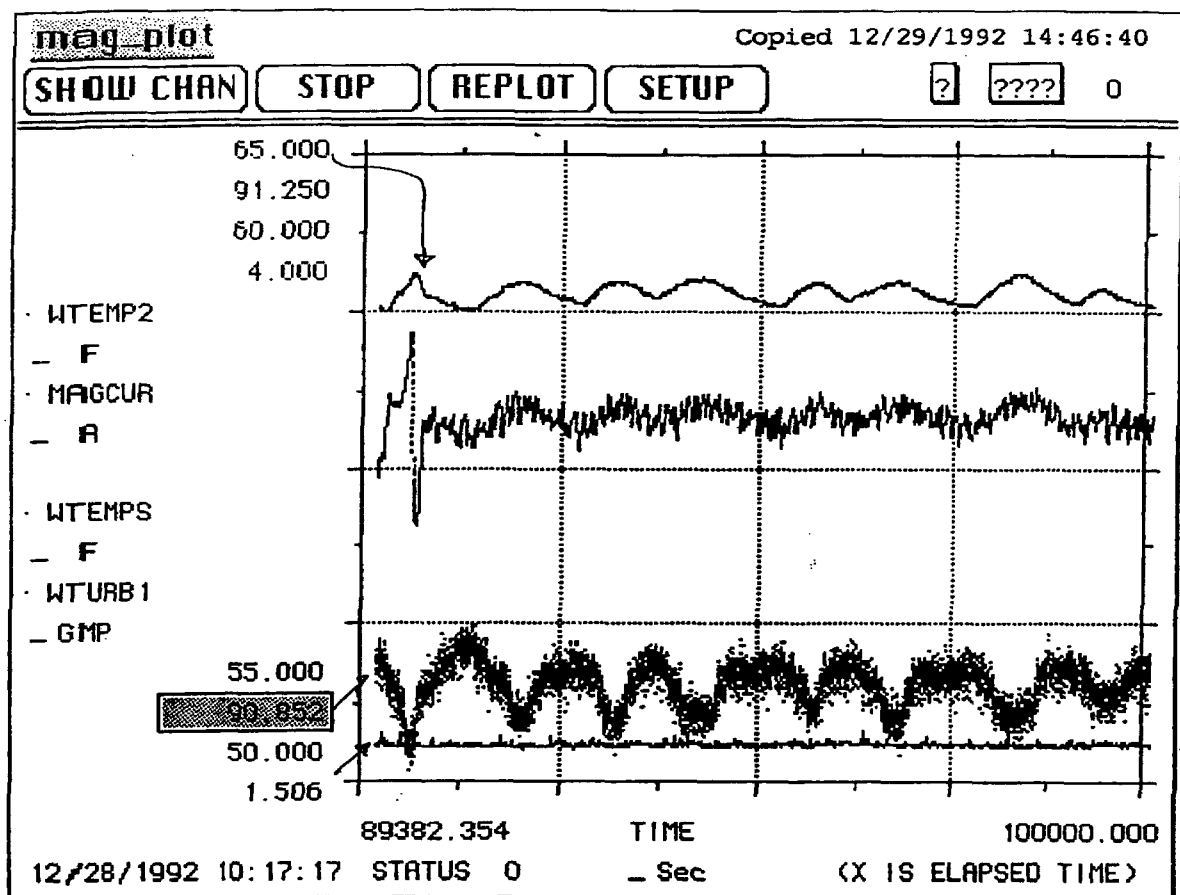


FIG. 1



For 7.5 kGauss at the center of the magnet.

fig. 4

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